UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Metal Mine
(Copper Ore)

Fatal Machinery Accident
December 5, 2004

Washington Group Nevada
Contractor I.D. No. # AJA

at

Robinson Nevada Mining Company
Robinson Operation
Ruth, White Pine County, Nevada
Mine I.D. No. 26-01916

Investigators

Karonica V. Glover
Supervisory Mine Safety and Health Inspector

Gerald A. Killion
Mine Safety and Health Inspector

Joseph A. Rhoades
Mine Safety and Health Specialist

Dale P. Ingold
General Engineer

Originating Office
Mine Safety and Health Administration
Western District
2060 Peabody Road, Suite 610
Vacaville, California 95687
Lee D. Ratliff, District Manager

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OVERVIEW

On December 5, 2004, Michael J. Squire, mechanic, age 31, and Gary M. Blackham, welder, age 23, were fatally injured while changing the bolts on the latching mechanism insert on the bucket (dipper) of a loading shovel. The victims were working between the dipper door and the dipper when the weld on a steel support that was blocking the dipper door failed, causing the door to close and strike them.

The accident occurred because safe work procedures had not been established for blocking the shovel dipper door.

GENERAL INFORMATION

Robinson Operation, a surface copper ore operation, owned and operated by Robinson Nevada Mining Company, was located in Ruth, White Pine County, Nevada. The principal operating official was Thomas Henderson, mine manager. The mine normally operated two 12 hour shifts a day, 7 days a week. Total employment was 105 persons.

Copper ore was mined from an open pit containing multiple benches. The mined material was drilled, blasted, loaded, and hauled to a primary crusher. The material was crushed and conveyed to the main plant where it was processed and sold for a variety of industrial uses.

Washington Group Nevada located in Ruth, Nevada, was contracted to drill, load, and haul the ore bearing rock to the primary crusher. The victims were employed by Washington Group Nevada. 170 persons worked at the mine for Washington Group Nevada.

The last regular inspection at this operation was completed on July 20, 2004.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Michael Squire and Gary Blackham, (victims) reported to work at 5:00 a.m., their normal starting time. About 6:30 a.m., Gerald Jordt, maintenance foreman, received a call from Leadford Hall, shovel operator. Hall stated that the latch bar on the dipper door was not working properly. Apparently, the bolts securing the latching mechanism insert loosened, causing the latch bar to malfunction.

Jordt assigned his maintenance crew to replace the insert bolts for the latching mechanism. Jordt, Blackham, and Jason Robinson, mechanic, went to the 6800 bench in the pit where the electric shovel was loading material. Jordt told Hall to extend the dipper so that gravity would open the dipper door. He then called for a rubber tire dozer to come over to the pit area. The dozer operator used the blade of the dozer to push the 16,770 pound dipper door further open.

Blackham, with the assistance of Robinson, then welded a steel bar, between the door and the dipper, to secure the door. After the steel bar was welded in place, the dozer left the area. Jordt then instructed Hall to lift and move the dipper back toward the shovel with the teeth down and dipper heel raised about 24 inches off the ground.

Squire had just finished his assigned job and joined the repair crew. While standing between the dipper door and the dipper, Blackham cut the head of the bolts off and Squire drove the bolts out of the insert. Jordt and Robinson were also standing inside the door helping Squire and Blackham remove the bolts. Jordt told Robinson to step up inside of the dipper to work on one of the bolts. Jordt then turned and walked out between the door and the dipper to converse with Hall.

The weld failed on the steel bar holding the door open, and it suddenly slammed shut, pinning Blackham and Squire against the dipper. Jordt called on the radio for help. Emergency personnel arrived and notified the county coroner who pronounced both victims dead at the scene. Death was attributed to crushing trauma.

INVESTIGATION OF THE ACCIDENT

MSHA was notified of the accident at 9:00 a.m., on December 5, 2004, by a telephone call from Robert Gunter, mine operations manager, to Ronald Goldade, assistant district manager. An investigation was started the same day. An order was issued pursuant to Section 103(k) of the Mine Act to ensure the safety of the miners. MSHA's accident investigation team traveled to the mine, conducted a physical inspection of the accident site, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, miners, and the State of Nevada mine inspectors.

DISCUSSION

Location of the Accident

The accident occurred at the Veteran Tripp Pit on the 6800 Bench located in the pit area. The weather conditions were sunny and about 15 degrees Fahrenheit. The ground was relatively level and frozen.

P&H Electrical Shovel

The electric loading shovel was a P&H Model 2300 XPA built in 1988. The shovel was equipped with a 28 cubic yard capacity dipper that had a door weighing about 16,770 pounds. The dipper door opened when the dipper was raised and the latch bar was retracted. The latch bar was located on the backside of the door and extended below the door where it engaged the latching mechanism. The latching mechanism insert, a replaceable wear piece, was located at the point where the latch bar rubbed the mechanism. The dipper door was made with a two inch lip around the bottom part of the door. The dipper frame was fabricated from T1 steel.

Steel Bar

The steel bar used to hold the dipper door open was a worn cutting edge that had been used as a grader blade. The bar was fabricated from15B30 steel and measured approximately 4 inches wide, 29 inches long, and one inch thick. Grader blades are typically made of very hard, strong, and highly wear resistant steel. The steel had a hardness of 43.4 on the Rockwell C scale and a tensile strength of approximately 180,000 pounds per square inch. The Lincoln Electric Company recommended preheating 15B30 steel to 600 degrees Fahrenheit to properly complete the weld.

Examination of the Welds

Dirt and paint were visible adjacent to the weld indicating that the weld area had not been cleaned or preheated. After the accident, the weld remained fused to the dipper frame but portions of the base metal on the bar were torn out by the failure. These

portions failed because the surface preparation and welding procedure used were not compatible with the materials being welded.

The steel bar was welded perpendicular to the door on a slight 5.85 degrees angle outward. The opposite end of the steel bar went by the dipper frame and was welded in place by two separate welds measuring 3 7/8 inches and ¾ inches in length. The 3 7/8 inch weld was on a downward angle at the dipper frame and measured about 28 inches from the door. The center of the weld on the dipper door and the dipper were approximately 70 inches and 68 inches, respectively from ground level.

Experience and Training

Squire had 11 years mining experience and Blackham had three years mining experience. Both victims had received training in accordance with 30 CFR, Part 48.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following causal factors were identified.

Causal Factor: A risk assessment to identify possible hazards and establish safe procedures was not conducted with the crew prior to performing the task of changing the bolts on the shovel dipper latching mechanism.

Corrective Action: A policy should be implemented requiring risk assessments to be conducted prior to performing maintenance or repair tasks. Potential hazards should be identified and procedures to safely complete the task should be established and followed.

Causal Factor: Management policies, standards, and controls were inadequate. Procedures had not been established to ensure miners were protected while working to repair the door latching mechanism. The dipper door was not properly blocked against motion to prevent the door from closing.

Corrective Action: The mine operator should develop and implement procedures that ensure machinery components are blocked against hazardous motion. Personnel assigned to perform maintenance or repair tasks should be knowledgeable regarding the proper procedures to block machinery components against motion. Manufacturer's recommendations should be reviewed prior to performing repair of machinery.

CONCLUSION

The accident occurred because safe work procedures had not been established for blocking the shovel dipper door. The manufacturer's recommendations had not been reviewed prior to performing this maintenance task. A thorough Risk Assessment had not been conducted with the repair crew prior to starting this task.

ENFORCEMENT ACTION

Order No. 6365890 was issued on December 5, 2004, under provisions of Section 103 (k) of the Mine Act:

A double fatal accident occurred at this operation on December 5, 2004, when a mechanic and a welder were caught between the bucket and the bucket door on a P&H 2300 XPB Electrical Shovel. This order is issued to assure the safety of persons at this operation and prohibits any work in the affected area until MSHA determines that it is safe to resume normal operations as determined by an Authorized Representative of the Secretary of Labor. The mine operator shall obtain approval from the authorized representative for all actions to recover and/or restore operations in the affected area.

This order was terminated on December 21, 2004. The conditions that contributed to the accident have been corrected and normal mining operations can resume.

Washington Group Nevada

Citation No. 6353247 was issued on January 24, 2005, under the provisions of Section 104 (d) (1) of the Mine Act for violation of 30 CFR 56.14105:

A double fatal accident occurred at this operation on December 5, 2004, when a mechanic and welder were changing the bolts on the Dutchman insert (latching mechanism) located between the dipper door and the bucket of a P&H 2300 Electric Shovel s/n 54090. The dipper door weighing 16,770 pounds was not adequately blocked against hazardous motion. A section of used cutting edge blade was welded inside the dipper door to the bucket to hold the door open. The weld failed causing the door to release and fatally injured the two victims. Failure to provide adequate blocking to prevent hazardous motion of machinery components constitutes more than ordinary negligence and is unwarrantable failure to comply with a mandatory safety regulation.

This citation was terminated on January 24, 2005. The mine operator has implemented a procedure for opening, restraining, and blocking the dipper door on the P&H 2300 Electric Shovel. The employees assigned to perform this task have been trained in these procedures.

Approved by:

_____ Date: _____

Lee D. Ratliff
District Manager

APPENDICES

A. Persons Participating in the Investigation
B. Pictures of Electric Shovel

APPENDIX A

Persons Participating in the Investigation

Washington Group Nevada

Bradley D. Giles	corporate vice president
Gary E. Kilstrom	manager
Hugh Lawrence	safety supervisor
Clayton C. Krall	project manager
Robert R. Gunter	mine operations manager

Quadra Mining LTD

Don E. Evans	safety director

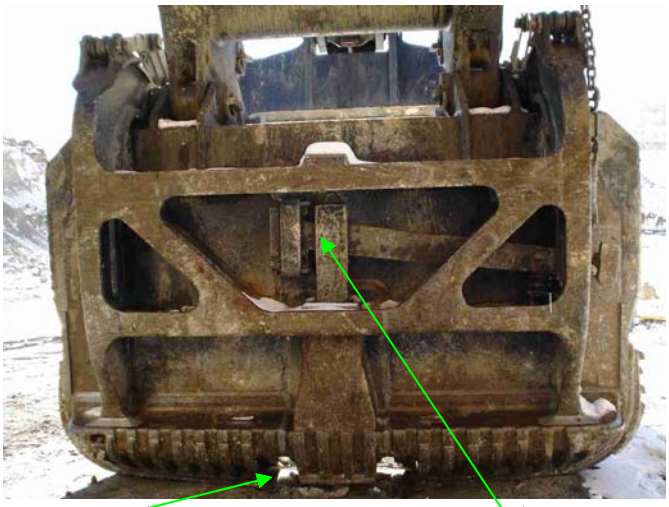
State of Nevada

Kenneth E. Curtis	mine inspector
Tim Kilbreath	mine inspector/training specialist
Cindy L.Hartman	boiler and pressure vessel inspector/mine inspector

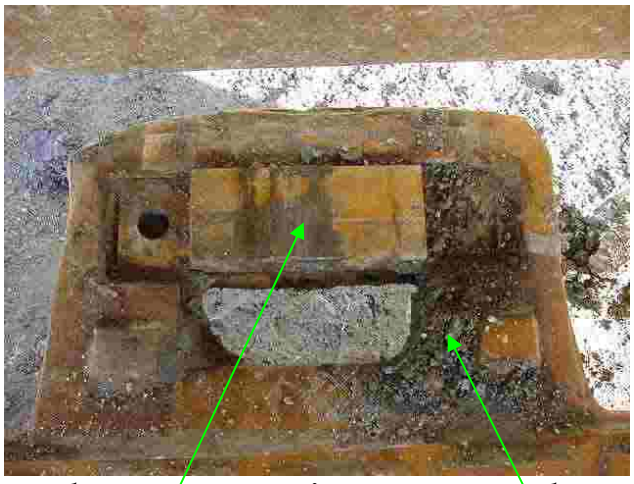
Mine Safety and Health Administration

Karonica V. Glover	supervisory mine safety and health inspector
Gerald A. Killion	mine safety and health inspector
Joseph A. Rhoades	mine safety and health specialist
Dale P. Ingold	general engineer

APPENDIX B



Dutchman **Picture #1** Latch Bar



Dutchman Insert **Picture #2** Dutchman